IN THE CLAIMS

Please make the following amendments to the claims.

1). (currently amended) A method, comprising:

analyzing each routine, of a software program having a plurality of separately

compilable routines, to create a plurality of local side-effect <u>lattice</u> problems for each

routine; and

merging the local side-effect <u>lattice</u> problems to create a global side-effect <u>lattice</u>

problem.

2). (currently amended) The method of claim 1, further comprising:

computing a global solution to the global <u>lattice</u> problem; and

splitting the global solution into local solutions.

3). (original) The method of claim 2, further comprising:

determining for each routine, whether a pointer parameter within the routine is

used to write to or read from a storage device.

4). (original) The method of claim 3, further comprising:

determining for each routine whether the pointer parameter is used to derive a

return value of the routine.

5). (currently amended) The method of claim 4, further comprising:

computing a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one <u>or more of a return, write, and read effect.</u> ~~of a PURE effect; LOST effect; RETURN effect; OUT effect; IN effect; RETURN, OUT, and IN effect; RETURN and OUT effect; RETURN and IN effect; and OUT and IN effect.~~

6). (original) The method of claim 5, further comprising:

providing the lattice values to an interprocedural analysis solver to optimize compilation of the software program.

7). (currently amended) The method of claim 6, further comprising:

representing the local side-effect <u>lattice</u> problems as directed graphs having edges and vertices, wherein

each edge has an associated monotone transfer function;

each vertex has a vertex value, wherein the vertex value is one of <u>a</u> formal parameter, implicit parameter, local pointer variable, or gate parameter; and

a subset of <u>the</u> vertices is marked with <u>the</u> lattice values.

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8). (currently amended) A computer-readable medium having stored thereon a plurality of instructions, said plurality of instructions when executed by a computer, cause said computer to perform:

analyzing each routine, of a software program having a plurality of separately compilable routines, to create a plurality of local side-effect lattice problems for each routine; and

merging the local side-effect lattice problems to create a global side-effect lattice problem.

9). (currently amended) The computer-readable medium of claim 8 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

computing a global side-effect lattice solution to the global side-effect lattice problem; and

splitting the global side-effect lattice solution into local side-effect lattice solutions.

10). (original) The computer-readable medium of claim 9 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

determining for each routine, whether a pointer parameter within the routine is used to write to or read from a storage device.

11). (original) The computer-readable medium of claim 10 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

determining for each routine whether the pointer parameter is used to derive a return value of the routine.

12). (currently amended) The computer-readable medium of claim 11 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform,

computing a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect. ~~of a PURE effect; LOST effect; RETURN effect; OUT effect; IN effect; RETURN, OUT, and IN effect; RETURN and OUT effect; RETURN and IN effect; and OUT and IN effect.~~

13). (original) The computer-readable medium of claim 12 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

providing the lattice values to an interprocedural analysis solver to optimize compilation of the software program.

14). (currently amended) The computer-readable medium of claim 13 having stored thereon additional instructions, said additional instructions when executed by a computer, cause said computer to further perform:

representing the local side-effect lattice problems as directed graphs having edges and vertices, wherein

each edge has an associated monotone transfer function;

each vertex has a vertex value, wherein the vertex value is one of a formal parameter, implicit parameter, local pointer variable, or gate parameter; and

a subset of the vertices is marked with the lattice values.

15). (currently amended) A system, comprising:

a processor;

memory connected to the processor storing instructions for interprocedural side-effect analysis executed by the processor;

storage connected to the processor that stores a software program having a plurality of separately compilable routines,

wherein the processor analyzes each routine, of the software program, to create a plurality of local side-effect lattice problems for each routine; and

merges the local side-effect lattice problems to create a global side-effect lattice problem.

16). (currently amended) The system of claim 15, wherein the processor computes a global solution to the global lattice problem; and splits the global solution into local solutions.

17). (original) The system of claim 16, wherein the processor determines for each routine, whether a pointer parameter within the routine is used to write to or read from the storage device.

18). (original) The system of claim 17, wherein the processor determines for each routine whether the pointer parameter is used to derive a return value of the routine.

19). (currently amended) The system of claim 18, wherein the processor:

computes a lattice value associated with each of the pointer parameters, wherein the lattice value comprises one or more of a return, write, and read effect. of a PURE effect; LOST effect; RETURN effect; OUT effect; IN effect; RETURN, OUT, and IN effect; RETURN and OUT effect; RETURN and IN effect; and OUT and IN effect.

20). (original) The system of claim 19, wherein the processor:

provides the lattice values to an interprocedural analysis solver to optimize compilation of the software program.

21). (currently amended) The system of claim 20, wherein the processor:

represents the local side-effect <u>lattice</u> problems as directed graphs having edges and vertices, wherein

    each edge has an associated monotone transfer function;

    each vertex has a vertex value, wherein the vertex value is one of <u>a</u> formal parameter, implicit parameter, local pointer variable, or gate parameter; and

    a subset of <u>the</u> vertices is marked with <u>the</u> lattice values.